REMARKS

Amendments

The claims are amended to use language in accordance with conventional US practice. In addition, claim 15 is amended to incorporate the recitation of claim 17, now cancelled.

New claim 22 is directed to a further aspect of the invention. See, e.g., page 3, lines 33-36.

Objection to the Abstract

The Abstract is amended to be less than 150 words. Withdrawal of the objection is respectfully requested.

Rejection under 35 USC 112, second paragraph

Claim 8 is amended above to depend from claim 7, rather than claim 9. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 102(b)/103(a) in view of Seiberle et al. (WO 01/29148)

Claims 15, 16, and 19-21 are rejected as allegedly being anticipated or obvious in view of Seiberle (WO 01/29418).

This rejection is not applied to claim 17. Claim 15 is amended above to incorporate the feature of claim 17, thereby rendering moot the instant rejection. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Seiberle et al.

Claim 17 is rejected as allegedly being obvious in view of Seiberle et al. (WO' 148). This rejection is respectfully traversed.

Seiberle et al. disclose a method for producing a topologically structured polymer film or coating. The process comprises mixing at least two materials together and then applying the mixture to a substrate. Thereafter, at least one of the materials is removed, such as by using a solvent that is inactive towards the other material. The material that is removed is non-crosslinkable whereas the retained material is crosslinkable. The material that is

crosslinkable is subjected to crosslinked after application of the mixture to the substrate, but before removal of the non-crosslinkable material by the solvent. See, e.g., the paragraph bridging pages 1-2.

As described at page 2, lines 17-23, by applying the mixture to the substrate a transparent homogeneous film is formed. The film is subjected to crosslinking, such as by exposure to UV light, whereby the crosslinkable material progressively crosslinks and the crosslinkable and non-crosslinkable materials gradually "demix." Upon completion of the crosslinking, the non-crosslinkable material is removed (by solvent or by evaporation) to create pores on a sub-micrometer scale.

The rejection refers to the embodiments in Figures 1a-1c of Seiberle et al. As described at the bottom of page 12, Figure 1a shows a film having pores with an average diameter of 200 nm and a height of 90 nm. Figure 1b shows a film having pores with an average diameter of 180 nm and a height of 120 nm. Figure 1c shows a film having pores with an average diameter of 100 nm and a height of 50 nm.

In the rejection, it is acknowledged that Seiberle et al. do not disclose data indicating that the pores are distributed uniformly about a mean value within an interval. However, it is argued that it would be obvious to provide a normal distribution of pore dimensions because such uniformity would be desirable.

However, merely because such a feature is asserted to be desirable does not mean that such a feature is achievable using the process of Seiberle et al. As discussed above, the process utilized by Seiberle et al. involves pore formation by removing non-crosslinkable material through the use of a solvent or by evaporation. Such techniques do not suggest that size of the pores formed can be controlled to the extent that a uniform size distribution about a mean value within an interval is achievable. Moreover, the process of Seiberle et al. does not suggest that one can obtain a nanostructure in which depressions have different depths within an interval between 30 nm and 210 nm, and which are distributed uniformly about a mean value within the interval.

In view of the above remarks, it is respectfully submitted that Seiberle et al. fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Seiberle et al and Levy

Claim 18 is rejected as allegedly being obvious in view of Seiberle (WO' 148) in combination with Levy (US 5,541,762). This rejection is respectfully traversed.

The disclosure of Seiberle et al. is discussed above. In the rejection, it is asserted that Seiberle et al. disclose certain applications of their film including embodiments wherein grooves are formed in the film (see page 11, lines 1-10). It is noted that the films of Seiberle et al. are described as anti-reflective or optical diffusers. See page 1, lines 1-7.

Levy is cited in the rejection for its disclosure of a Fresnel lens. Specifically, at column 6, lines 1-8, Levy describe designs of automobile rearview mirrors that can be utilized various optic technologies such as "Fresnel optics." Contrary to the implication in the rejection, Levy does not disclose use of a Fresnel lens to reduce glare.

In the rejection, it is asserted that it would be obvious to modify "the mold taught by Seiberle" to form a Fresnel lens to reduce glare. However, the rejection fails to explain why one would modify the anti-reflective coating or optical diffuser film of Seiberle et al. so as to function as a Fresnel lens. Further, the rejection fails to explain how modifying the anti-reflective coating or optical diffuser film of Seiberle et al. so as to function as a Fresnel lens would reduce glare.

In view of the above remarks, it is respectfully submitted that Seiberle et al., alone or in combination with the disclosure of Levy, fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Seiberle et al., D'Amato et al., and Nakano

Claims 1-7 and 10-13 are rejected as allegedly being obvious in view of Seiberle et al. (WO' 148) in combination with D'Amato et al. (US 5,071,597) and Nakano et al. (JP-5-45503). This rejection is respectfully traversed.

The disclosure of Seiberle et al. is discussed above. In the rejection, reference is made to the disclosure of Seiberle et al. at page 12, lines 7-12. In this portion of the disclosure, Seiberle et al. disclose that their topologically structured film or coating "can be used as a master to make replica of isotropic or anisotropic topological structures of various materials." In particular, Seiberle et al. describe applying a layer of aluminum onto the film or coating and then subsequently separating the layer of aluminum from the underlying film or coating.

However, Seiberle et al. do not describe a process for producing a transparent optical element wherein a reference element is provided, having a respective surface exhibiting an irregular nanostructure, which is used to make a mold, and the mold is then used to make a transparent optical element. In the process described by Seiberle et al., the topologically structured film or coating functions as the mold to form the structured aluminium layer. It does not function as a reference element which is used to form a mold. Further, in the Seiberle et al. process the aluminium layer is applied to the mold, i.e., the topologically structured film or coating. It is not applied to a reference element. Nor was the topologically structured film or coating, coated with the aluminium layer, used in an electroforming process to make a mold. See, for example, page 10 of applicants' specification

The rejection relies on the disclosure of D'Amato et al. regarding further aspects of molding processes. Specifically, D'Amato et al. disclose a molding process for providing plastic articles with a "hologram or other microstructure." In the process, a mold is formed by electrodeposition of a metal layer onto at least one surface of a model of an object to be molded, wherein the surface has "a surface relief pattern of a hologram, diffraction grating or other microstructure." This provides a mold element having the shape of the model to be molded and a replica of the surface relief pattern. See column 1, lines 55-67. The mold element can then be combined with a backing plate (see, e.g., Figures 6A and 6B; column 7, lines 32-49), and then combined with other elements to form a complete mold which can be used, for example, in injection molding. See, e.g., column 7, line 66 – column 8, line 27 and Figures 6A and 6B)

However, D'Amato et al. does not describe the manufacture of optical elements having an irregular nanostructure. As noted above, the process of D'Amato et al. concerns forming a mold with a surface relief pattern which is a microstructure. Furthermore, D'Amato et al. provides no suggestion of using any molding process to make an anti-reflective coating or optical diffuser film.

As noted above, the function of the process described by Seiberle et al. is to make an optical element, such as an anti-reflective coating or optical diffuser film, by a process involving formation of a porous structure through dissolution or evaporation of a non-crosslinkable material. The only implication of a molding process in the disclosure of Seiberle et al. involves using a porous polymeric structure, formed by dissolution or

evaporation of a non-crosslinkable material, to make an aluminum layer. Neither Seiberle et al. nor D'Amato et al. provide any suggestion of using a molding process to make a transparent anti-reflective coating or optical diffuser film. In addition, the process of disclosure D'Amato et al. is directed to making a pattern. See, e.g., column 4, lines 16-32. D'Amato et al. provides no suggestion a using a molding process to create an irregular nanostructure.

Thus, in view of the above remarks, one skilled in the art would not look to the disclosure of D'Amato et al. to modify the process of Seiberle et al. But, moreover, even if the disclosures were combined, the result would not yield applicants' claimed invention as neither reference suggests the use of ion bombardment to form an irregular nanostructure on a reference element, which element is then used to make a mold for forming a transparent optical element with an irregular nanostructure and which provides reduced interfacial reflection.

With respect to ion bombardment, the rejection relies on the disclosure of Nakano et al. In paragraphs [0047]-[0048], Nakano et al. disclose the preparation of an optical element by irradiation of a substrate with an ion beam, and that the resultant irradiated substrate shows lower reflectance characteristics than non-irradiated substrates. The rejection asserts that it would be obvious to use the ion bombardment procedure in the process of Seiberle et al. to make the ant-reflective structure.

However, such a modification would result in the complete elimination of the Seiberle et al. process. As discussed, the Seiberle et al. process makes an optical element, such as an anti-reflective coating or optical diffuser film, by forming a porous structure through dissolution or evaporation of a non-crosslinkable material. To switch to an ion bombardment procedure would effectively eliminate the function of Seiberle et al.'s process of making the porous structure. Additionally, Nakano et al. do not describe the use of ion bombardment to make an irregular nanostructure, nor does Nakano et al. overcome the deficiencies in the disclosures of Seiberle et al. and D'Amato et al. with respect to the steps of applicants' claimed molding process.

In view of the above remarks, it is respectfully submitted that Seiberle et al., taken alone or in combination with D'Amato et al. and/or Nakano et al., fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Seiberle et al., D'Amato et al., Nakano, and Piccard

Claim 8 is rejected as allegedly being obvious in view of Seiberle (WO' 148) in combination with D'Amato et al. (US 5,071,597), Nakano et al. (JP-5-45503), and Piccard (US 2,649,622). This rejection is respectfully traversed.

The disclosures of Seiberle et al., D'Amato et al. and Nakano et al. are discussed above. Piccard discloses a process wherein a phonograph record is formed by cutting a groove in wax or plastic. Then, the phonograph record is made electrically conductive by depositing gold vapor. Copper is then plated thereto. The resultant copper sheet is then removed and used as a "master" to make multiple stampers that have a nickel surface.

Piccard does not disclose or suggest the use of a gold layer in the formation of a mold for making an irregular nanostructure in an optical element. Moreover, the disclosure of Piccard does not overcome the deficiencies in the combined disclosures of Seiberle et al., D'Amato et al. and Nakano et al. discussed above.

In view of the above remarks, it is respectfully submitted that Seiberle et al., taken alone or in combination with D'Amato et al., Nakano et al., and/or Piccard, fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Rejection under 35 USC 103(a) in view of Seiberle et al., D'Amato et al., Nakano, and Veeco

Claim 9 is rejected as allegedly being obvious in view of Seiberle (WO' 148) in combination with D'Amato et al. (US 5,071,597), Nakano et al. (JP-5-45503), and the data sheet from Veeco. This rejection is respectfully traversed.

Firstly, it is noted that the Veeco data sheet was published in 2006 and thus does not constitute prior art with respect to applicants' claimed invention. In any event, the disclosure of the Veeco data sheet does not overcome the deficiencies in the combined disclosures of Seiberle et al., D'Amato et al. and Nakano et al. discussed above.

In view of the above remarks, it is respectfully submitted that Seiberle et al., taken alone or in combination with D'Amato et al., Nakano et al., and/or the Veeco data sheet, fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully

requested.

Rejection under 35 USC 103(a) in view of Seiberle et al., D'Amato et al., Nakano, and Bier et al.

Claim 14 is rejected as allegedly being obvious in view of Seiberle (WO' 148) in combination with D'Amato et al. (US 5,071,597), Nakano et al. (JP-5-45503), and Bier et al. (US 5,849,414). This rejection is respectfully traversed.

The disclosures of Seiberle et al., D'Amato et al. and Nakano et al. are discussed above. Bier et al. disclose a method for coating surfaces of a polycarbonate molded part, composed of a polycarbonate based on a diphenol, with a material obtained by hydrolytic polycondensation of an aluminum compound of an organofunctional silane and an oxide component. The material is applied at a thickness of from 2 to 200 μm and is cured at a temperature of from 135°to 180° C. See column 1, lines 27-60. In the example, a commercially available polycarbonate is coated with a 20 μm thick layer of scratch-resistant coating which is Ormocer®.

Bier et al. provide no suggestion of how to modify a molding process for preparing transparent optical elements. Further, the disclosure of Bier et al. does not overcome the deficiencies in the combined disclosures of Seiberle et al., D'Amato et al. and Nakano et al. discussed above.

In view of the above remarks, it is respectfully submitted that Seiberle et al., taken alone or in combination with D'Amato et al., Nakano et al., and/or Bier et al., fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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